

## ABSTRACT OF THE DISCLOSURE

An LED-based spectrophotometer uses a reconstruction algorithm, based on spectral information of an illumination source and a reference spectrophotometer, to convert integrated multiple illuminant measurements from a non-fully illuminant populated color sensor into a fully populated spectral curve using a reference database. A dynamic, Least Squares-based spectral reconstruction algorithm, used to reconstruct spectra, gives greater importance to the data from the reference database in the neighborhood of the color sample under measurement. This is done using linear operators.